IN THE MATTER OF

U.S. Patent Application No. **10/765,954**

By Samsung Electronics Co., Ltd.

I, Soohyun Shin, an employee of Y.P. LEE, MOCK & PARTNERS of Koryo Bldg., 1575-1 Seocho-dong, Seocho-gu, Seoul, Republic of Korea, hereby declare that I am familiar with the Korean and English language and that I am the translator of the enclosed documents for U.S. Application No. 10/765,954 and certify that the following is, to the best of my knowledge and belief, a true and correct translation

Signed this 08th day of June 2007

Soohyun Shin

◈ In-Service Invention Report

<<The right to register the present invention related to a duty is assigned to the company based on Article 39, Paragraph 40 of the Korean Patent Law>>

◎ The present in-service invention is transmitted to DM Lab. Intellectual Property Team (Suwon)

◎ Title of the Invention: Structure 2 for reducing access time in write once recording apparatus

◎ Invention Classification: Self-Invented

◎ Inventors

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◎ In-Service Report Files

File Name	File Description
Structure 2 for reducing access time in write once recording apparatus.gul	A structure for solving a problem of excessive access time in a write once recording apparatus
Structure 2-1 for reducing access time in write once recording apparatus.gul	

◎ Invention Evaluation

Subject of Evaluation		Date	Grade	Opinion
Inventor	Hwang Sung Hee	05 February 2003	A	For suggesting a standard
Director	In Sik Park	05 February 2003	A	For suggesting a standard
Patent Department		06 February 2003	A	-
Evaluation Committee		19 August 2003	B	-

◎ In-Service Invention Progress Dates

Inventor's Report Date: 05 February 2003

Director's Approval Date: 05 February 2003

Patent Department Receipt Date: 06 February 2003

◎ In-Service Invention Receipt No.: AA-200302-006-1

Summary of the Invention

In order to update information in a write-once recording apparatus, a new area of the write-once recording apparatus must be allotted since it is impossible to delete data that has been recorded and record new data thereon like a rewritable recording apapratus. Accordingly, an area is allotted based on the possible number of times of updating the information and the size of the area that can be allotted, and the information is recorded whenever it is updated by dividing the area. (Generally, the recording will be performed continuously in the allotted area). When the location of information finally updated in unknown, data in the domain should be reproduced from the beginning and search for the information finally updated. When the size of the area is reduced, it may be possible to find the information quickly, but the number of times of updating the information will decrease.

If a defect management (DM) by a drive is to be realized in the write-once recording apparatus, such updating operations will increase more. This is because when a disk is removed from the drive, information related to a temporary DM should be updated. Also, information related to disc and drive will be updated.

Accordingly in the present invention, the location of information finally updated is searched quickly by reducing access time using a separate temporary access start address area (TASAA).

Possible Area: Areas possible to lead-in, lead-out, and write.

Drawings of the Invention

1. Location of TASAA (In case of lead_in area)

. . .
TASAA
Area A
Area B
Area C
Recording Condition Test Area
. . .

The TASAA is possible not only in a lead-in area but also in a lead-out area, and it is possible to arrange the TASAA in each of the lead-in area and the lead-out

area for robustness. The areas A, B, and C are areas wherein updated information is recorded. The updated information includes all types of information updated in other areas besides the lead-in area, such as disc and drive information, which indicates states of a disc and a drive, a temporary disc definition structure (TDDS) and a temporary defect list (TDFL) of temporary defect management information for a defect management by a drive.

2. Structure of TASAA

FIG. 2.1

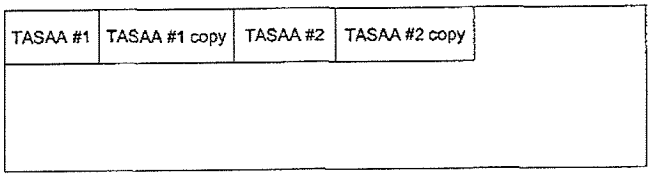
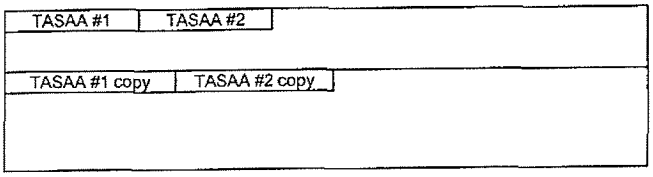


FIG. 2.2



It is possible to record in plural as shown in FIGS. 2.1 and 2.2 for robustness. When TASAA is arranged in both of the lead-in area and the lead-out area, it is possible to write once in each area. Also, the recording can be performed from the end of the area to the beginning of the area.

3. Content in TASAA #n

TASAA Identifier = "SA"
TASAA No.
Number of Pieces of Location Information
Initial Access Location Information of Area A
Initial Access Location Information of Area B
Initial Access Location Information of Area C
Latest Location Information that can be tested in Recording Condition Test Area
. . .

Operations of the Invention

Let's assume that an update unit of area A information is operation A, an update unit of area B information is operation B, and an update unit of area C information is operation C. At this time, an update unit of TASAA is as follows. When at least one of the number of operating times of each of operation A, operation B, and operation C reaches a predetermined number of operating times, or when the sum of the number of operating times of each of operation A, operation B, and operation C reaches a predetermined number of operating times, location information, in which latest information of each of operation A, operation B, and operation C is recorded, and location information that can be tested after the recording condition test area are recorded. Also, as soon as TASAA is updated, the number of operating times of each of operation A, operation B, and operation C is reset. In order to obtain the latest information of area A, area B, and area C at a reproduction point, TASAA should be accessed first, reproduce the final TASAA #n information, and search for TASAA. TASAA is accessed from an initial address to obtain the latest information tat is finally reproduced in that area. If recording is not possible anymore (if the write-once recording apparatus should be finalized), location information about the latest information of another area is recorded in TASAA regardless of the time information in TASAA should be updated.

Effect of the Invention

Let's assume that an ECC correction unit is a block and reproduction time of one block is '1'. At this time, recording will be performed in a block unit, which is an ECC correction unit. When the amount of information that is to be updated, after one operation of operation A, operation B, and operation C, exceeds one block, effect of TASAA increases. Accordingly, let's assume that the amount of information that is to be updated is enough with one block, and allot areas in following sizes to each of area A, area B, and area C.

Area A: 1000 Blocks, Operation A = process a number of operating times

Area B: 1000 Blocks, Operation B = process a number of operating times

Area C: 1000 Blocks, Operation C = process a number of operating times

Let's assume that TASAA is updated when the sum of the number of operating times is 30.

In this case, a time for obtaining the latest information from areas A, B, and C

depends on whether TASAA is present or not, as follows:

When TASAA is present: (a+b+c)/30 + (a+b+c)%30

When TASAA is not present: a+b+c

In conclusion, the time for obtaining the latest information from areas A, B, and C is the same regardless of the inclusion of TASAA, until an operation is performed thirty times. However, once a number of operating times is more than 30, a time required to reproduce information from twenty nine blocks can be saved when the operation is further performed thirty times. If an operation is performed 299 times in an area, it is possible to save a time required to reproduce information from 260 blocks, i.e., 9*29-1=260. In other words, when TASAA is not present, the time to reproduce 299 blocks is required. However, when TASAA is present, only a time to reproduce 39 blocks is required. Accordingly, the latest information can be obtained quickly.